

WHAT IS CLAIMED IS:

1 1. A method for reducing a condition associated with fetal alcohol
2 syndrome in a subject who is exposed to alcohol *in utero*, the method comprising
3 administering to the subject an ADNF polypeptide in an amount sufficient to reduce the
4 condition associated with fetal alcohol syndrome.

1 2. The method of claim 1, wherein the ADNF polypeptide is a
2 member selected from the group consisting of:

3 (a) an ADNF I polypeptide comprising an active core site having the
4 following amino acid sequence:

5 Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1);

6 (b) an ADNF III polypeptide comprising an active core site having the
7 following amino acid sequence:

8 Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2); and

9 (c) a mixture of the ADNF I polypeptide of part (a) and the ADNF III
10 polypeptide of part (b).

1 3. The method of claim 1, wherein the ADNF polypeptide is a
2 member selected from the group consisting of a full length ADNF I polypeptide, a full
3 length ADNF III polypeptide, and a mixture of a full length ADNF I polypeptide and a
4 full length ADNF III polypeptide.

1 4. The method of claim 1, wherein the ADNF polypeptide is an
2 ADNF I polypeptide.

1 5. The method of claim 4, wherein the ADNF I polypeptide is Ser-
2 Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1).

1 6. The method of claim 4, wherein the ADNF I polypeptide is
2 selected from the group consisting of:

3 Val-Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:14);

4 Val-Glu-Glu-Gly-Ile-Val-Leu-Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-
5 Ala (SEQ ID NO:15);

6 Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:16);

7 Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:17);
8 Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:18); and
9 Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:19).

1 7. The method of claim 4, wherein the ADNF I polypeptide
2 comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus
3 of the active core site.

1 8. The method of claim 1, wherein the ADNF polypeptide is an
2 ADNF III polypeptide.

1 9. The method of claim 8, wherein the ADNF III polypeptide is Asn-
2 Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1 10. The method of claim 8, wherein the ADNF III polypeptide is
2 selected from the group consisting of:

3 Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:20);
4 Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID NO:21);
5 Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID
6 NO:22); and
7 Ser-Val-Arg-Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser
8 (SEQ ID NO:23).

1 11. The method of claim 8, wherein the ADNF III polypeptide
2 comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus
3 of the active core site.

1 12. The method of claim 1, wherein the ADNF polypeptide is a
2 mixture of an ADNF I polypeptide of part (a) and an ADNF III polypeptide of part (b).

1 13. The method of claim 12, wherein the ADNF I polypeptide is Ser-
2 Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1), and wherein the ADNF III
3 polypeptide is Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1 14. The method of claim 12, wherein the ADNF I polypeptide is
2 selected from the group consisting of:

3 Val-Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:14);

4 Val-Glu-Glu-Gly-Ile-Val-Leu-Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-
5 Ala (SEQ ID NO:15);
6 Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:16);
7 Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:17);
8 Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:18);
9 Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:19); and
10 Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1); and wherein the ADNF III
11 polypeptide is selected from the group consisting of:
12 Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2);
13 Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:20);
14 Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID NO:21);
15 Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID
16 NO:22); and
17 Ser-Val-Arg-Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser
18 (SEQ ID NO:23).

1 15. The method of claim 12, wherein the ADNF I polypeptide
2 comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus
3 of the active core site of the ADNF I polypeptide, and wherein the ADNF III polypeptide
4 comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus
5 of the active core site of the ADNF III polypeptide.

1 16. The method of claim 1, wherein at least one of the ADNF
2 polypeptide is encoded by a nucleic acid which is administered to the subject.

1 17. The method of claim 1, wherein the condition is decreased body
2 weight of the subject.

1 18. The method of claim 1, wherein the condition is decreased brain
2 weight of the subject.

1 19. The method of claim 1, wherein the condition is a decreased level
2 of VIP mRNA or protein of the subject.

1 20. The method of claim 1, wherein the condition is decreased viability
2 of the subject *in utero*.

1 21. The method of claim 1, wherein the condition is decreased
2 learning.

1 22 A method for reducing neuronal cell death, the method comprising
2 contacting a neuronal cell with a mixture of an ADNF I polypeptide and an ADNF III
3 polypeptide in an amount sufficient to reduce neuronal cell death,
4 wherein the ADNF I polypeptide comprises an active core site having the
5 following amino acid sequence:

6 Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1); and

7 wherein the ADNF III polypeptide comprises an active core site having the
8 following amino acid sequence:

9 Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1 23. The method of claim 22, wherein the ADNF I polypeptide is a full
2 length ADNF I polypeptide and the ADNF III polypeptide is a full length ADNF III
3 polypeptide.

1 24. The method of claim 22, wherein the ADNF I polypeptide is Ser-
2 Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1), and wherein the ADNF III
3 polypeptide is Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1 25. The method of claim 22, wherein the ADNF I polypeptide is
2 selected from the group consisting of:

3 Val-Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:14);

4 Val-Glu-Glu-Gly-Ile-Val-Leu-Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-
5 Ala (SEQ ID NO:15);

6 Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:16);

7 Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:17);

8 Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:18);

9 Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:19); and

10 Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1); and wherein the ADNF III
11 polypeptide is selected from the group consisting of:

12 Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2);

13 Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:20);

14 Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID NO:21);

15 Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID
16 NO:22); and
17 Ser-Val-Arg-Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser
18 (SEQ ID NO:23).

1 26. The method of claim 22, wherein the ADNF I polypeptide
2 comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus
3 of the active core site of the ADNF I polypeptide, and wherein the ADNF III polypeptide
4 comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus
5 of the active core site of the ADNF III polypeptide.

1 27. The method of claim 22, wherein at least one of the ADNF
2 polypeptide is encoded by a nucleic acid.

1 28. A pharmaceutical composition comprising a pharmaceutically
2 acceptable excipient and a mixture of an ADNF I polypeptide and an ADNF III
3 polypeptide, wherein the ADNF I polypeptide comprises an active core site having the
4 following amino acid sequence:

5 Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1); and
6 wherein the ADNF III polypeptide comprises an active core site having the following
7 amino acid sequence:

8 Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1 29. The pharmaceutical composition of claim 28, wherein the ADNF I
2 polypeptide is a full length ADNF I polypeptide and the ADNF III polypeptide is a full
3 length ADNF III polypeptide.

1 30. The pharmaceutical composition of claim 28, wherein the ADNF I
2 polypeptide is Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1), and wherein the
3 ADNF III polypeptide is Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1 31. The pharmaceutical composition of claim 28, wherein the ADNF I
2 polypeptide is selected from the group consisting of:

3 Val-Leu-Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:14);
4 Val-Glu-Glu-Gly-Ile-Val-Leu-Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-
5 Ala (SEQ ID NO:15);

6 Leu-Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:16);
 7 Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:17);
 8 Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:18)
 9 Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:19); and
 10 Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1); and wherein the ADNF III
 11 polypeptide is selected from the group consisting of:
 12 Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2)
 13 Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:20);
 14 Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID NO:21);
 15 Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID
 16 NO:22); and
 17 Ser-Val-Arg-Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser
 18 (SEQ ID NO:23).

1 32. The pharmaceutical composition of claim 28, wherein the ADNF I
 2 polypeptide comprises up to about 20 amino acids at at least one of the N-terminus and
 3 the C-terminus of the active core site of the ADNF I polypeptide, and wherein the ADNF
 4 III polypeptide comprises up to about 20 amino acids at at least one of the N-terminus and
 5 the C-terminus of the active core site of the ADNF III polypeptide.

1 33. The pharmaceutical composition of claim 28, wherein at least one
 2 of the ADNF polypeptide is encoded by a nucleic acid.